its variation in different specimens, and endeavor to find out for ourselves its prevailing form and characteristics.

It may be that our investigations will lead us to conclusions differing from those which are commonly held; in which case we have a right to modestly hold and express them, until the uncertain points are settled.

Finally, the motives which should induce us to study and collect shells are varied; but among them may be mentioned the laudable desire to possess a series of objects which are of great beauty, both in outline and in color; next, the wish to learn the form, nature, and habits of the creatures which belong to one of the great sub-kingdoms of the animate world; then an endeavor to study the questions relating to the real meaning of the terms genus, species, and variety; how far they are natural and how far artificial; and lastly, to study modern mollusks so that we may be fitted to understand and interpret the numerous fossil shells which figure so extensively in the geological records of this grand old planet.

NOTES ON SOME NORTHERN PUPIDAE WITH DESCRIPTION OF A NEW SPECIES.

BY. DR. V. STERKI.

Of late, I have received, from a number conchologists in different parts of the country, many valuable Pupidae, partly sent for examination or determination, partly in exchange or cheerfully given for my collection, which now contains about 375 lots (of N. Am. Pupidae). But I need many more, especially of some difficult and doubtful species and groups, for a thorough study of this family. A part of these newer acquisitions are of so much importance, either systematically, or in habits, that a few notes about them may be welcome to the student of our malacological fauna. The latter becomes more and more interesting, as our knowledge of the distribution of the species is widening and their varieties and local forms are more numerous. But also new species have been found, and more doubtless will follow, as was and is to be expected from the immense area of our country, of which only a small part has been thoroughly investigated as to these little creatures.

Some species and groups are omitted here, although I have received highly valuable materials of them, partly because they need being studied further, partly as I intend to treat them separately.

Pupa fallax Say.

This species has been collected, in typical form, on Curacao (Mazyck Coll.), a fact which may prove, that P. modica Gld. is not only a southern form of fallax.

Pupa arizonensis.

The shells sent out under this name by Gabb, or at least most of them, are known to be nothing else than P. fallax, e. g., those in Smithsonian Inst. Coll., in Coll. of the Acad. of Philadelphia. When I found nothing else, in several of the richer private collections, I also began thinking that *P. arizonensis* was nothing else than a synonym of *fallax*, in spite of the description and even more the figure in Binney's work, which seemed to point to something of another kind. But since I have seen the (only) type specimen of that fig. in B. & B. Coll. (Central Park Mus., N. Y.), I know that there is really such a thing as *P. arizonensis* existing. The specimen is somewhat weathered, somewhat grayish-white, the epiconch lost—so that the original color cannot be determined exactly—but otherwise in good condition. It is best compared with *P. corticaria*, of the same shape, but larger (alt. 3, 5 m.), has no trace of lamellæ, and a thickened lip. Now, a short time ago, I received, by the kindness of Mr. L. B. Elliott, of Iowa City, a few examples of this same species. They had been collected, as Mr. E. writes, "at Siligman, Arizona, by an entomological friend, in the nests of large and fierce ants, used as materials to build the nests." They were also somewhat weathered, but fair. And again Mr. Elliott sent me a number of Pupidae, collected at Albuquerque, New Mexico, highly valuable things, among which there were 2 examples of our species, in the same condition. One of the Arizona specimens still bears its epiconch and the color is a pale horn; all have rather fine, remote, rib-like striæ, more crowded near the aperture.

A controversy may arise about the name: Whether Gabb has seen this shell, is not sure, but very improbable; his own description[1]—not to speak of the originals mentioned above—doubtless refers not to this species, but a form of *P. fallax*, not differing even as a var. from the type. On the other hand there is no doubt but that the descrip-

[1] 7 Am. Journ. Conch. II, p. 331, Oct. 1, 1866, pl. 21, f. 6.

tion and figure in Binney's work represent this species, and consequently are the first authentic publication. Thus, in my opinion, we have to write: *P. arizonensis* Binney.

Pupa holzingeri Sterki.

This species has a very wide range of distribution in the northwest and west. I found 2 exa. among Pupidae from Helena, Mont., sent by Mr. T. B. Elliott, and one in the lot already mentioned from Albuquerque, N. M., not much different from Illinois exa. In this regard it seems to resemble its relatives, *P. contracta* and also *armifera* which are remarkably constant all over the country, while some other species show a decided variability even in the same place.

Pupa curvidens Gould.

From my studies, during about 5 years, of my own exa. (22 lots of *curvidens* 34 of *pentodon* from all over the country) and a good many other collections, altogether thousands of specimens, I became satisfied that this species is to be taken up and separated from *P. pentodon* Say. It is smaller, almost always more slender, and the whorls are more slowly increasing, so that the last is relatively smaller and less predominating than in *pentodon*. Quite generally, there is, on the palatal wall near the aperture, a marked crest, and behind that an impression, deepest at the place of the inferior palatal lamella. The lamellæ are nearly the same in both, and decidedly variable as to their number (except the typical, apertural, columellar, basal and the two palatals) but by far more so in *curvidens* than in *pentodon*.

A marked difference is in the station of the two. While *pentodon* prefers low, moist localities, in company of Vertigo ovata, most Hyalinias, the tumid, smooth form of Carychium (exiguum Say), *curvidens* is found more in "upland" places, even on banks, steep slopes, together with Vert. bollesiana Morse, Hyalinia exigua Stimpson and the slender, regularly striated Carychium, where rarely or never a Vertigo ovata will be found. It is our commonest Pupa, here and in other parts of Ohio. P. cincinnatensis Judge is identical with it.

On a gravelly bank at New Philadelphia there is a peculiar form of our species; long, slender, nearly cylindrical, with only 5 typical lamellæ, no accessory ones; the color is somewhat greenish, and in weathered specimens not so white as in the type. The same form has been collected at Sewanee, Tenn., by Mr. Sanderson Smith, with

the common, or typical, form; and it probably will be found elsewhere. It is so characteristic that I thought it not out of the way to name it *var. gracilis.*

P. curvidens is found nearly everywhere east of the Rocky Mountains, but it seems to go not quite so far west and north as pentodon does.

(*To be continued.*)

GENERAL NOTES.

A party of naturalists from the Academy of Natural Sciences of Philadelphia sailed from New York on the 16th of February, for Yucatan and Southern Mexico. Extensive collections of plants, mollusks, birds, insects, etc., will be made, and volcanic and other geological phenomena studied. Prof. Heilprin, Messrs. Stone, Ives, Baker and Leboutillier make up the *personnel* of the party.

We are indebted for the illustrations in this number of the NAUTILUS to Dr. W. D. HARTMAN, of West Chester, Pa., author of the excellent little book, "Conchologia Cestrica,"—now becoming scarce—and of numerous papers on *Partula* and *Achatinella*. Some months ago we had the pleasure of going over the Doctor's collection of these beautiful shells. In completeness it is certainly one of the first rank, surpassing, probably, any other collection of these two genera. In *Helicina*, *Melania* and South Sea Helices it is also very rich.

Prof. H. A. WARD, of Rochester, N. Y., spent a few hours with us recently. During the past year Prof. Ward has collected extensively on the West Coast of South America and visited the Exposition at Paris.

WANTED.—Correspondents interested in Corbiculidae. Also Helices of Cumberland subregion. Offered: *Limnaea Adelinae*, *Glyptostoma Newberryanum*, *Lucapina erenulata*, *Monoceros paniculiratum*, etc. EDWARD W. ROPER, Revere, Mass.

ERRATA.—In the January NAUTILUS the following corrections should be made:

p. 102, 10th line from top, for "West" read "Wet."

p. 102, 5th line from bottom, for "Chester" read "Custer."

p. 103, 20th line from top, for "West" read "Wet."

A blunder also occurs in the name of Mr. M. Burton Williamson, University P. O., Cal.